2019 IEEE GRSS STRATUS Workshop

Systems and Technologies for Remote Sensing Applications Through Unmanned Aerial Systems

25-27 February 2019

Louise Slaughter Hall
Rochester Institute of Technology
Rochester, New York, USA
RIT Campus Map with Parking Lots
(See next page for parking instructions)
Shuttle Bus Transportation and Parking

MONDAY: For tutorials, you can park in Lot “T”

TUESDAY/ WEDNESDAY:

1. There will be a shuttle from Lot “B” to Lot “T”

2. Run times for both days will be:
   a. 7:30 AM to 9:30 AM
   b. 3:30 PM to 5:30 PM
   c. Bus will run approximately every 14 minutes.
   d. Transportation outside of these times is detailed on next page, “RIT Shuttle Bus”

3. Our STRATUS BUS will be a “white bus with green lettering”.
   a. The Cedar Bus Company
   b. There will be a “STRATUS” sign in the window
   c. Stay in vehicle until bus arrives
RIT Shuttle Bus Transportation
(For pick up and drop off between 9:30 AM and 3:30 PM)

TUESDAY/ WEDNESDAY:

1. This is the RIT Bus System.

2. There will be a shuttle between Lots “B” and “J”
   a. Lot “J” is next to Lot “T” (see map above)

3. Run times are as follows:

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<thead>
<tr>
<th>B Lot</th>
<th>J Lot</th>
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<tr>
<td>Pickup</td>
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<table>
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<tr>
<th>J Lot</th>
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Tear out and Use Parking Pass, if Needed
Building 78, Louise Slaughter Hall
Monday, Room 2140
Tuesday and Wednesday, Rooms 2210-2240
Map to Social Gathering Tuesday Evening

- Tuesday February 26
- 6pm
- Finger foods and one free drink
- 2.2 miles from Louise Slaughter Hall

MacGregor's Grill and Tap Room
www.macgregorsgtr.com
300 Jefferson Road
Rochester, NY 14623
585-427-8410

Finger foods and one free drink
2.2 miles from Louise Slaughter Hall
MONDAY 25 FEBRUARY
Louise Slaughter Hall, Room 2140

TUTORIALS

TUTORIAL 1 ........ 8:00 AM TO 10:30 AM
Introduction to UAV Radiometry and Reflectance, 
Chris Durell of Labsphere, Inc.

10:30 AM ......................... Coffee Break

TUTORIAL 2 ........ 11:00 AM TO 1:30 PM
UAS Focused Photogrammetry / Mapping with 
Pix4D, Angad Singh of Pix4D, Inc.

1:30 PM ......................... Lunch

TUTORIAL 3 ........ 2:30 PM TO 5:00 PM
Creating automated processing workflows for 
multi-band UAS data using the Algorithm Toolkit, 
Dr. Brent Barlett of BeamIO
TUESDAY 26 FEBRUARY
Louise Slaughter Hall, Rooms 2210-2240

REGISTRATION & BREAKFAST . . . . 8:00 AM

WELCOME ........... 8:30 AM TO 9:00 AM
Dr. Emmett Ientilucci, RIT, CoChair
Dr. David Messinger, RIT, Director CIS
Dr. Ryne Rafellee, RIT, VP Research

KEYNOTE ............ 9:00 AM TO 9:45 AM
Moderator ..............Emmett Ientilucci, RIT
Dr. Sally Rockey, “The Role of Technology in Agriculture”, Executive Director of the Foundation for Food and Agriculture Research (FFAR)

SESSION 1

UAS HARDWARE 1
Session Chair: Emmett Ientilucci, RIT

9:45 AM Identifying and Quantifying DJI Camera Limitations, Aswin Balasubramaniam, Univ. of Cincinnati (USA) ................. [02]

10:05 AM Spectrometer Design and Analysis for Unmanned Aerial System Applications, Ethan Hughes, RIT (USA).................... [07]


10:45 AM ......................... Coffee Break

SESSION 2

UAS FOR ENVIRONMENTAL MONITORING
Session Chair: Bahram Salehi, SUNY ESF

11:15 AM Pipeline Oil Spill Mapping from UAV Imagery and Ancillary Electromagnetic Induction Survey Data, Alberta Canada, Masoud Mahdianpari, Memorial University (Canada); Bahram Salehi, SUNY ESF (USA); Fariba Mohammadimanesh, Memorial University (Canada); Glen Larsen, AKS Geoscience (Canada); Derek Peddle, University of Lethbridge (Canada). .......................... [17]

11:35 AM UAV Image Processing for Iceberg 3D Modelling, Bahram Salehi, SUNY ESF (USA); Somayeh Yavari, Memorial University (Canada); Rob Briggs, C-Core (Canada) ................. [25]

11:55 AM Integrated UAV Data Flow Analysis for Rapid Decision-making in Runoff and Sediment Redistribution Risk and Remediation Planning, Chris Renschler, University at Buffalo (USA); Willard Schulmeister, Jacob Albright, EagleHawk One Inc. (USA) . . . [22]

12:15 PM Geospatial Assessments of environmental impacts of marine debris in the Gulf-of Guinea Coast, Samuel Akande, Federal University of Technology Akure (Nigeria). .................................................. [09]

12:35 PM Networking Lunch and GROUP PHOTO
SESSION 3

UAS IMAGE PROCESSING/ALGORITHM DEVELOPMENT

Session Chair: **Chris Renschler**, Univ. at Buffalo

2:05 PM **A New Point Cloud Refinement Method for Tree Height Estimation of UAV Imagery**, Bahram Salehi, SUNY ESF (USA); Sepideh Yavari, Memorial University (Canada) ..........................[10]

2:25 PM **Hyperspectral and LiDAR Data Acquisition and Processing**, Carson Roberts, Headwall Photonics, Inc. (USA). .................[12]

2:45 PM **Scientific grade hyperspectral data quality from UAV platform, in the VNIR-SWIR range, focusing on real time processing for mine face scanning**, Trond Loke, Norsk Elektro Optikk AS-NEO, (Norway) ................. [14]

3:05 PM **Applying reconfigurable algorithm chains to multi-band UAS data using the Algorithm Toolkit**, Brent Bartlett, BeamIO (USA). ..............................[16]

3:25 PM ....................... Coffee Break

SESSION 4

AGRICULTURAL APPLICATIONS OF UAS

Session Chair: **Peter Spacher**, Hobart and William Smith Colleges

3:55 PM **Monitoring Crop Growth Using UAS and Satellite Imagery**, Emily Myers, John Kerekkes, Timothy Bauch, Nina Raqueño, Grady Saunders, RIT (USA); Craig Daughtry, Andrew Russ, USDA Hydrology and Remote Sensing Lab (USA) ................................. [03]

4:15 PM **Spatial-Temporal Pattern Analysis for Quantification of Cotton Root Rot Progression within a Growing Season Using UAV Remote Sensing**, Pappu Yadav, Alex Thomasson, Tianyi Wang, Thomas Chappell, Sorin Popescu, Lonesome Malambo, Sayantan Samanta, Texas A&M University (USA) ..........................[04]

4:35 PM **Combining Spatial and Temporal Corn Yield Variability for Development of Management Zones**, Tulsi Kharel, Angel Maresma, Karl Czymmek, Emmaline Long, Sheryl Swink, Cornell University (USA); Erasmus Oware, University at Buffalo (USA); Quirine Ketterings, Cornell University (USA) ..........................[15]

6:00 PM ....................... Social Gathering

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300 Jefferson Road
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Finger foods and one free drink
2.2 miles from Louise Slaughter Hall
WEDNESDAY 27 FEBRUARY
Louise Slaughter Hall, Rooms 2210-2240

REGISTRATION & BREAKFAST . . . . . 8:15 AM

WELCOME DAY 2 . . . . . 8:50 AM TO 9:00 AM
Dr. Chris Renschler, Univ. at Buffalo, CoChair
Dr. Bahram Salehi, SUNY ESF, Program Chair

KEYNOTE . . . . . . . . . . . . 9:00 AM TO 9:45 AM
Moderator . . . . . . . . Chris Renschler, Univ. At Buffalo
Dr. Steven Thomson, Applications of UAS and UGV's within Agricultural Cyber-Physical and Robotic Systems, National Program Leader, United States Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA).

SESSION 5

UAS HARDWARE 2
Session Chair: Emmett Ientilucci, RIT

9:45 AM Sensor Characterization and Calibration, Baabak Mamaghani and Carl Salvaggio, RIT (USA) .................... [27]

10:05 AM Spectral Analysis of Magnetometer Swing in High-Resolution UAV-borne Aeromagnetic Surveys, Callum Walter, Alexander Braun, Georgia Fotopoulos, Queen's University (Canada)..........................[11]

10:25 AM MX-1: A New Multi-Modal Remote Sensing UAS Payload with High Accuracy GPS and IMU, Daniel Kaputa, Timothy Bauch, RIT (USA); Carson Roberts, Headwall Photonics (USA); Don McKeown, Mark Foote, Carl Salvaggio, RIT (USA) ......................... [24]

SESSION 6

FOREST APPLICATIONS OF UAS
Session Chair: Jan van Aardt, RIT

11:15 AM Ground classification algorithm sensitivity analysis using digital aerial photogrammetry over conifer forest stands, Alex Graham, University of British Columbia (Canada).......................... [13]

11:35 AM Evaluation of UAS imagery for forest regeneration surveys, Muhammet Ali Ozderya Eddie Bevilacqua, SUNY ESF (USA) ............ [18]

11:55 AM Evaluation of UAS imagery for aboveground biomass assessment in mature forests, Mehmet Ozen, Eddie Bevilacqua, SUNY ESF (USA) ....................[20]

12:15 PM Shadow Detection in Aerial and UAS data Using Neural Networks, Prasanna Reddy Pulakurthi, Emmett lentilucci, RIT (USA). . . . [26]

12:35 PM ....................... Networking Lunch

SESSION 7

SPECIAL INVITED TALKS
Session Chair: Don McKeown, RIT

2:05 PM UAV's Impact on Secondary Education in Precision Agriculture, Mark Mancari, Perry Central School District (USA).................[29]

2:25 PM UAS Safety, and the Role of the Flight Standards District Office, Robert Lacourse, Federal Aviation Administration (FAA) (USA)[28]
SESSION 8

WATER APPLICATIONS OF UAS

Session Chair: Anthony Vodacek, RIT

2:45 PM Real-time, sUAS-based detection of grapevine water status in the Finger Lakes Wine Country of Upstate New York, Rinaldo Izzo, RIT (USA); Alan Lasko, Cornell University (USA); Evan Marcellus, Tim Bauch, Nina Raqueño Jan van Aardt, RIT (USA) ......................[05]

3:05 PM Preliminary Testing of the senseFly thermoMAP Infrared Camera for Surface Water Temperature Measurements of a Small Lake - Wilmot, Ontario, Canada, Marie Hoekstra, Marzieh Foroutan, University of Waterloo (Canada); Kevin Kang, H2O Geomatics Inc. (Canada); Claude Duguay, University of Waterloo (Canada) ......................[06]

3:25 PM ......................... Coffee Break

3:55 PM Glint Correction of Unmanned Aerial System Imagery, Ryan Ford and Anthony Vodacek, RIT (USA) .........................[23]

STUDENT AWARDS. ................. 4:15 PM

CLOSING REMARKS. ................. 4:35 PM

POSTERS

Study of Harmful Algae Blooms Using UAS Imagery, Peter Spacher, Ileana Dumitriu, John Halfman, Hobart and William Smith Colleges (USA); Lisa Cleckner, Finger Lakes Institute (USA)................................................[08]